The Monthly Evening Sky Map

A SCIENTIFIC JOURNAL AND EDUCATIONAL GUIDE IN ASTRONOMY FOR THE AMATEUR

Founded in 1905 by Leon Barritt

ALSO A STAR, CONSTELLATION AND PLANET FINDER MAP ARRANGED FOR THE CURRENT MONTHS - MORNING AND EVENING - AND PRACTICAL ANYWHERE IN THE WORLD

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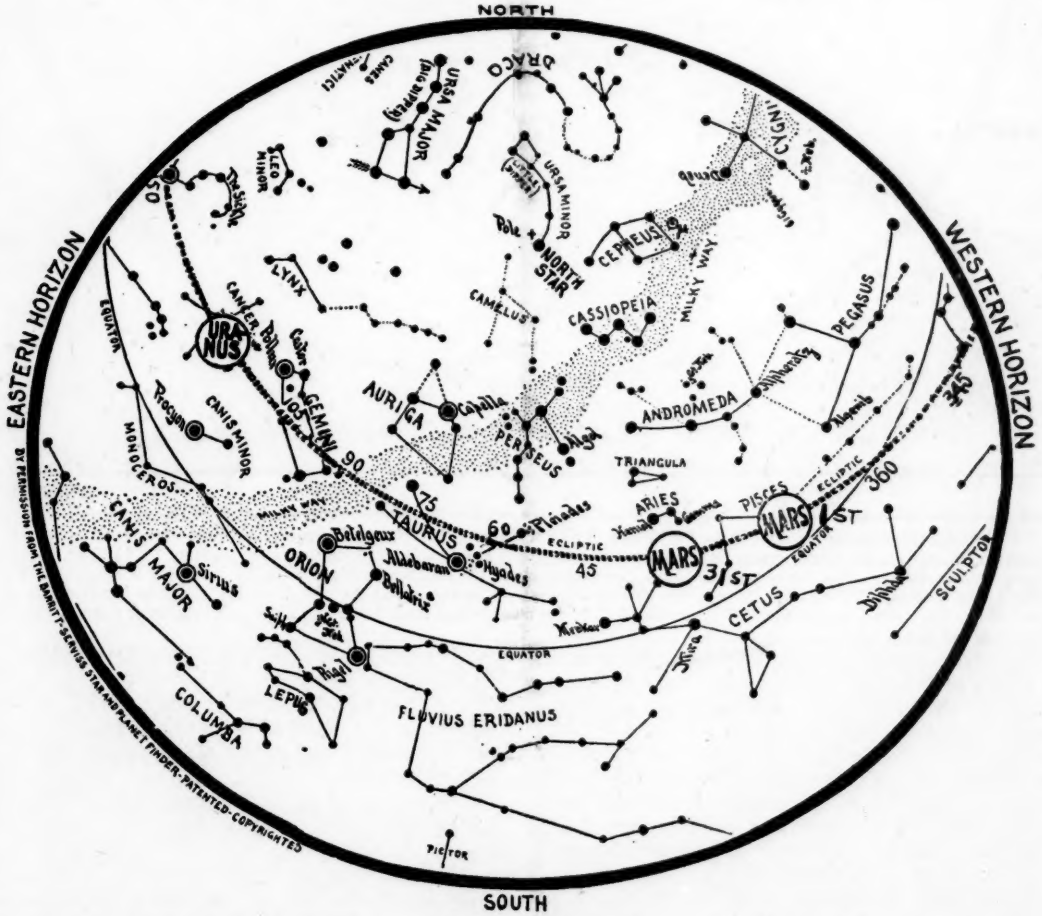
EVENING SKY MAP FOR JANUARY



AT 9:00 P.M., JAN. 1 8:00 P.M., JAN. 15 7:00 P.M., JAN: 31

Face South and hold the Map overhead, the top North, and you will see the stars and planets just as they appear in the heavens. The arrow through the two stars in the bowl of the Big Dipper points to the North Star, the star at the end of the handle of the Little Dipper.

This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitude in Europe.

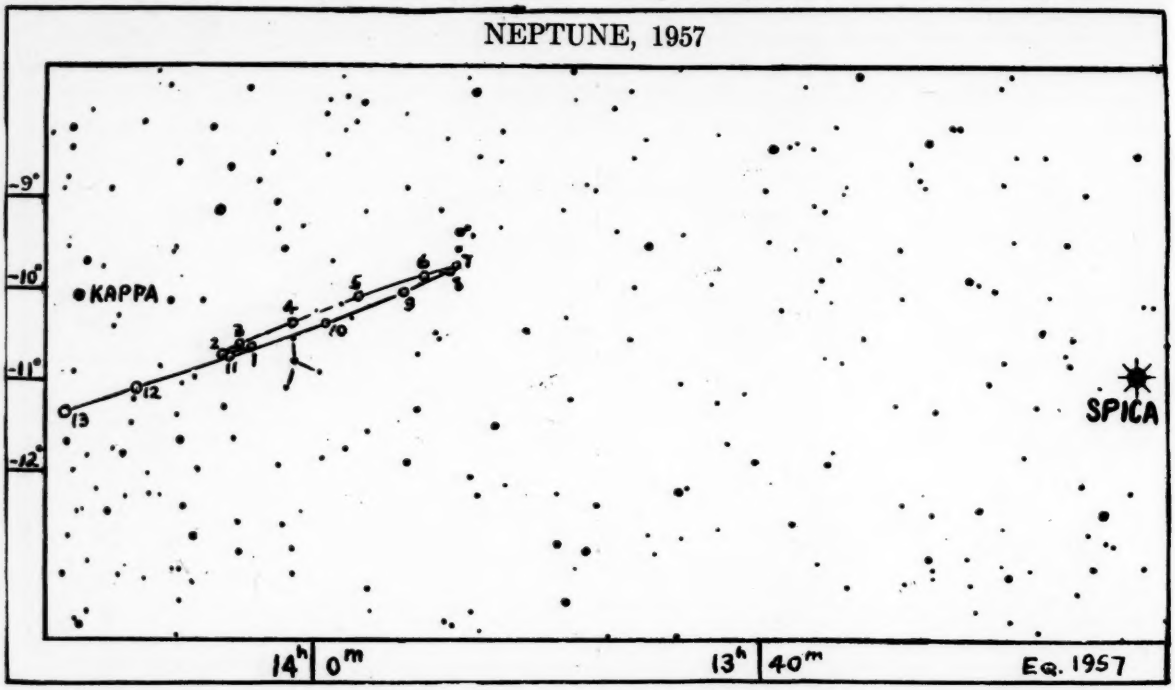
NEPTUNE

THE TELESCOPIC PLANET

If our solar system consisted of the Sun and one planet, only, the science of celestial mechanics would be a simple one. The laws which Kepler worked out over three hundred years ago would apply exactly with no need for modification of any sort. It was Kepler who determined that the orbits of planets were ellipses, and who formulated the law that "the radius vector (distance of the planet from the Sun) sweeps over equal areas in equal times". The importance of this law was great; it pushed the earth out of its central location in the universe and installed the Sun in its stead.

Kepler's laws were reduced by him to the famous "Equation of Kepler" and the problem of finding a planet's position in its orbit was made simple. However, we have been talking in terms of a one-planet solar system. Our system has many planets—some, giants like Jupiter and Saturn, others, meaning the asteroids, mere rock fragments. A major planet like Jupiter exerts a strong pull on the other members of the solar system, enough to make them deviate substantially from the undisturbed theoretical positions computed under Kepler's laws. The effect of this pull, known as *perturbations,* can be computed accurately, but, generally speaking, is a complicated and laborious task. Men like Le Verrier and Newcomb and Brown devoted their lifetimes to the preparation of exact tables of the motions of the Moon and planets.

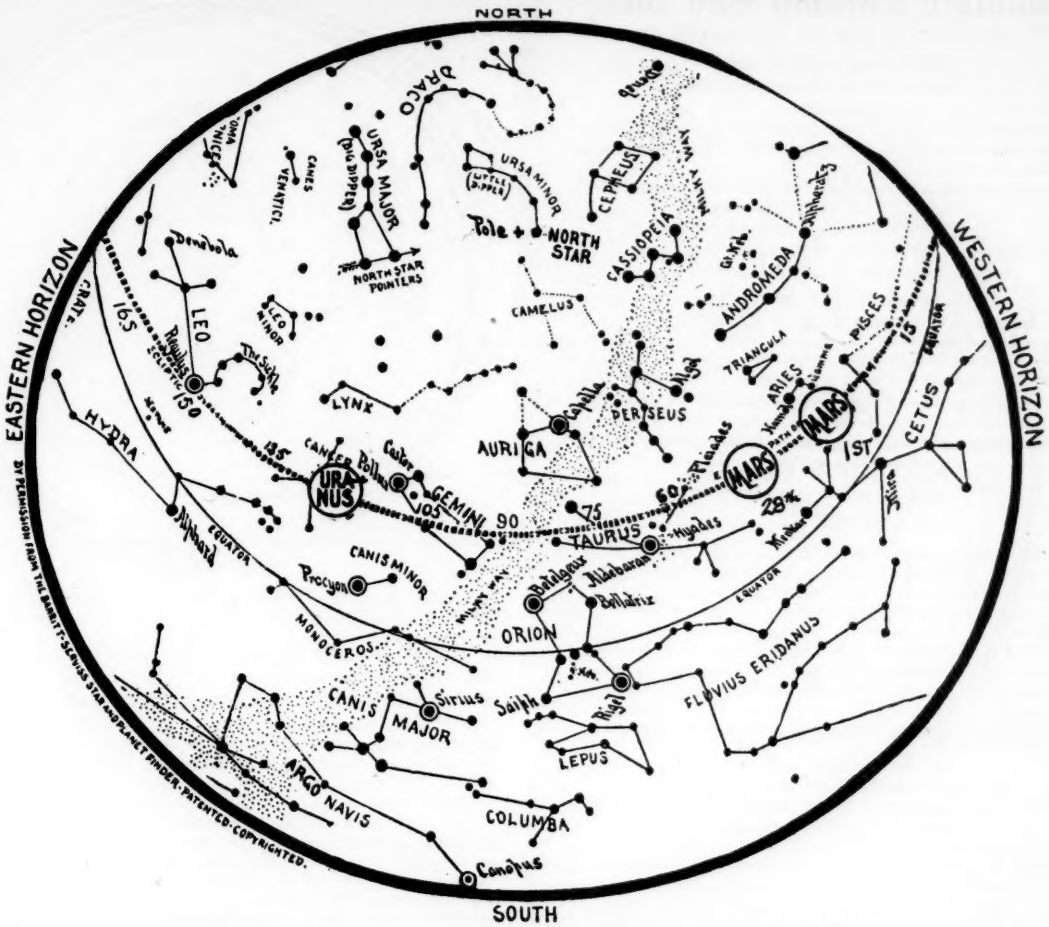
In the 18th century, Saturn marked the frontier of the solar system. In 1781, William Herschel discovered a new body, and announced it as a comet. Subsequent examination and mathematical work proved it to be a major planet outside Saturn's orbit. It was named Uranus. It was a tremendously important discovery—enough to earn knighthood for Herschel. Herschel was a very keen observer, or he might have taken Uranus for a star, as had other observers on many occasions. Almost a century earlier, Flamsteed determined the position of this "star" accurately; between then and Herschel's announcement, other astronomers observed and measured the position of this "star", never suspecting it to be a planet. These were, however, valuable observations, as they permitted the calculation of an accurate orbit. Something was wrong though. Uranus refused to stay within the path computed for it. While this departure was small after 50 years, it nevertheless was a measurable amount, equal to about 1/15th the diameter of the Moon. Two mathematicians came to the same, and the correct, solution independently of each other. They reasoned that an unknown major planet was pulling Uranus from its predicted path. J. C. Adams, in England, worked out a solution, and in 1845 told the Astronomer Royal approximately where to look for the suspected trans-Uranian planet. The Astronomer Royal did not, however, push the search to any extent until he learned that Le Verrier, in France, was publishing research similar to Adams'. By then it was too late, as Galle of Berlin, using the predicted position of Le Verrier, in conjunction with a new and complete star chart of the area, found and positively identified the new planet the first night of his search. So was Neptune discovered, through the mathematical wizardry of two independent researchers.



The path of Neptune among the stars of Virgo during the year 1957. The positions of the planet are given for the first day of each month, the month being indicated by its appropriate number (13 corresponding to January, 1958). The faintest stars, indicated on the chart by the smallest dots, are magnitude 9; the brightest, aside from Spica, is Kappa, at magnitude 4.3. The small, inverted "Y" of stars close to the path of Neptune, as mentioned in the text, is an easy guide to identification of the planet. The central star of the "Y" is magnitude 7.3; the others range from 8.0 to 8.3. Neptune's brightness remains almost invariable at magnitude 7.7.

For those of our readers who wish to see this planet for themselves, we are supplying a detailed chart of its location in Virgo. The faintest stars on this chart are approximately 9, or about a magnitude fainter than Neptune. Neptune can be seen with a one inch telescope, but it will be difficult. A three-inch telescope will show it up readily. As a suggestion, the little inverted "Y" of stars near Neptune can be centered in your telescope easily if you do the following: put a wide field eyepiece on the telescope, put Spica in the center of the field of view, then fasten the telescope in that position. Allow 38 minutes to pass, and the little "Y" will then be in the center of the eyepiece. Having located the little "Y", the identification of Neptune will be simple. The central star of the "Y" is a little brighter than Neptune. Happy hunting!

EVENING SKY MAP FOR FEBRUARY



AT 9:00 P.M., FEB. 1 8:00 P.M., FEB: 15 7:00 P.M., FEB. 28

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This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitudes in Europe.

The Sun setting on the wonderful Lunar Appenines, Eratosthenes, and Copernicus.
Photographed by Pease at Mt. Wilson

The

Monthly Evening Sky Map

FOUNDED IN 1905 BY LEON BARRITT

MRS. LEON BARRITT, Editor
Irving L. Meyer, Managing Editor

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AMATEUR'S FORUM

BY IRVING L. MEYER, M. S.

JANUARY 1957

THE SUN: after making its deepest penetration into the southern skies, begins a gradually accelerating climb northward. In Sagittarius on the 1st, it moves into Capricornus during January. The earth is closest to the Sun (perihelion) the 3rd at 91.3 million miles distance.

THE MOON: is at apogee (farthest from the earth) twice during the month—on the 4th at a distance of 252,000 miles and the 31st at 253,000 miles. It is closest to the earth (perigee) the 16th at 222,000 miles.

Libration: Maximum exposure of the region on the Moon's limbs takes place as follows:

January	5	South limb, 6.7°
January	11	East limb, 7.6°
January	18	North limb, 6.5°
January	23	West limb, 7.6°

The Moon's phases (E.S.T.):

First Quarter	January	9 at 2:06 am
Full Moon		16 at 1:21 am
Last Quarter		22 at 4:48 pm
New Moon		30 at 4:24 pm

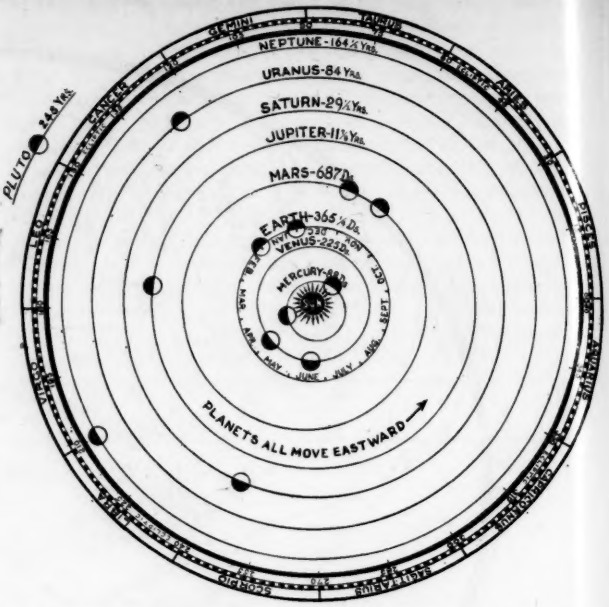
MERCURY: moves in a relatively restricted area of the sky entirely in the constellation Sagittarius. It commences the month in the evening sky, is in inferior conjunction with the Sun on the 10th and thereupon enters the morning sky. With its very rapid pace, by the end of the month it can be observed in the pre-dawn sky. The observer must look for a bright star in the twilight band, shortly before sunrise. On the last day of the month, magnitude will be 0.2 (about as bright as Vega, in Lyra) and it will be slightly gibbous in the telescope. Its disc, incidently, is about 7" in diameter and readily apparent in moderate sized telescopes. It is closest to the earth the 12th at 62 million miles.

VENUS: is a morning star all month, moving from Ophiuchus into Sagittarius. It is now on the far side of the Sun in relation to the earth, and its observability is worsening. It can still be seen in the pre-dawn sky, largely because of its brilliance (magnitude -3.3) rather than good location. On the 21st it is in conjunction with Mercury. the latter being about 2½° to the north, and affords a good "landmark" for the identification of Mercury. Geocentric distance increases from 138 million miles the 1st to 148 million miles the 31st.

MARS: has given up much of its lustre of last year, but still shines as a bright first magnitude object. It moves from Pisces into Aries, following a north-eastward path along the ecliptic. It sets at about midnight, which means it is close to the meridian at sunset. Its apparent diameter is around 8" all month, and is best situated to show a gibbous disc in the telescope. Distance is increasing rapidly—from 98 million miles the 1st, to 124 million miles the 31st.

JUPITER: is in Virgo, barely north of the equator. It rises before midnight, becoming a prominent object in the morning sky. Always bright and interesting, on the 15th it measures up as follows: distance 463 million miles; magnitude -1.8; equatorial diameter 39½"; polar diameter 37" (this flattening at the poles can be detected with the most modest telescopic equipment and arises from Jupiter's rapid axial rotation). The four bright satellites can be seen with opera glasses with ease, and present a different grouping daily.

HELIOCENTRIC POSITIONS OF THE PLANETS, JANUARY



The planets are shown in their respective orbits. Two positions, one for the first, and one for the last day of the month are given for Mercury, Venus, Earth, and Mars. The arrow indicates the last day of the month. Jupiter, Saturn, Uranus, Neptune, and Pluto are shown in their mean position for the current month.

SATURN: is in Ophiuchus, a morning sky object, and rapidly improving in position. It will appear somewhat brighter than its near neighbor, Antares, which will be to the south-west. Saturn will be best placed for observation in late spring. Distance the middle of this month is 993 million miles.

URANUS: is the best situated for observation of all the planets. In Cancer, close to Praesepe, the famous cluster, it comes to opposition with the Sun on the 24th. At best, however, Uranus is just visible to the naked eye, depending on the clarity of the atmosphere as well as the absence of Moonlight and the glow of city lights. At opposition, its magnitude is 5.7, brighter than average as the planet is approaching perihelion. Its diameter is 3.9", a disc readily perceptible under a magnification of 50 diameters. It is closest the 26th at 1630 million miles.

NEPTUNE: is creeping through the constellation Virgo, and is found about 10° east of Spica. Neptune is truly a telescopic planet —magnitude this month averages 7.8—but can be seen in the smallest telescope or with good binoculars. The main difficulty in identification is to distinguish this planet from the many stars of similar brightness in the area. A telescopic magnification of 100 times and upward will reveal the planets disc, which is only slightly over one-half the apparent size of that of Uranus. It rises at about midnight. Distance the middle of the month is 2828 million miles.

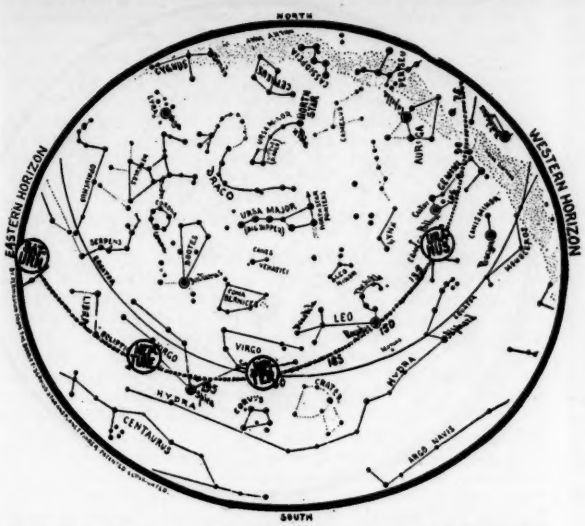
ASTRONOMICAL CALENDAR

Eastern Standard Time

JANUARY 1957

January	1—	1:— am	Mercury stationary in Right Ascension
	2—	6:47 am	Minimum of Algol
	2—	8:35 am	Conjunction, Mercury and Moon; Mercury south 3° 56'
	3—	1:— am	Earth in perihelion
	5—	1:— am	Mercury in perihelion
	5—	3:36 am	Minimum of Algol
	8—	12:26 am	Minimum of Algol
	8—	9:— am	Quadrature, Mars and Sun
	9—	3:45 am	Conjunction, Mars andMoon; Mars south 2° 56'
	10—	10:— am	Inferior conjunction, Mercury and Sun; Mercury north 2° 56'
	10—	9:15 pm	Minimum of Algol
	13—	6:04 pm	Minimum of Algol
	15—	7:— am	Mercury greatest heliocentric latitude north
	16—	2:53 pm	Minimum of Algol
	16—	6:17 pm	Conjunction, Uranus and Moon; Uranus north 5° 33'

MORNING SKY MAP FOR JANUARY



At 5:00 A.M., JAN. 1; 4:00 A.M., JAN. 15; 3:00 A.M., JAN. 31

16— 7:— pm	Jupiter stationary in Right Ascension
19—11:43 am	Minimum of Algol
20— 2:51 pm	Conjunction, Jupiter and Moon; Jupiter north 5° 54'
21—11:— am	Conjunction, Mercury and Venus; Mercury north 2° 49'
21— 1:— pm	Mercury stationary in Right Ascension
22— 8:32 am	Minimum of Algol
22— 3:— pm	Quadrature, Neptune and Sun
22— 7:07 pm	Conjunction, Neptune and Moon; Neptune north 3° 57'
23— 2:— pm	Venus in descending node
24—11:— pm	Opposition, Uranus and Sun
25— 5:21 am	Minimum of Algol
25— 6:38 pm	Conjunction, Saturn and Moon; Saturn north 0° 23'
28— 2:10 am	Minimum of Algol
28—10:44 am	Conjunction, Mercury and Moon; Mercury south 2° 1'
29—12:53 am	Conjunction, Venus and Moon; Venus south 4° 23'
30—11:00 pm	Minimum of Algol

AMATEUR'S FORUM

BY IRVING L. MEYER, M. S.

FEBRUARY 1957

THE SUN: is still far south of the equator, but as it moves from Capricornus into Aquarius it gathers speed in its northward motion. The earth is 91.5 million miles away the first, widening the gap to 92.0 million miles by the 28th.

THE MOON: is closest to the earth the 14th at 222,000 miles distance, and is farthest the 27th at 253,000 miles.

Libration: Maximum exposure of the region on the Moon's limbs takes place as follows:

February	1	South limb, 6.6°
February	9	East limb, 7.9°
February	15	North limb, 6.5°
February	20	West limb, 7.7°
February	28	South limb, 6.6°

The Moon's phases (E.S.T.):

First Quarter	February	7 at 6:23 pm
Full Moon		14 at 11:38 am
Last Quarter		21 at 7:18 am

This is a very unusual month in that there is no fourth phase (New).

MERCURY: travels from Sagittarius, through Capricornus to its eastern edge. In the morning sky all month, it can be observed for about the first week of the month. The observer must arise before daybreak and scan the lightening sky near the horizon in the east. Mercury will appear as a bright star though somewhat subdued by the twilight. Greatest elongation west occurs on the 2nd. Distance the 1st is 90 million miles, against 121 million miles the 28th.

SATELLITES OF JUPITER

JANUARY

Day	West							East							
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7					·3		1·	○	·4	2·					
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9						·2	·1	○		·3			·4		
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31							○	·2	4· ·1		·3				

Appearance of Jupiter and its satellites at 4:15 A.M., E.S.T. as seen in an inverting telescope

VENUS: is no longer well placed for observation. A morning star, it is rapidly disappearing behind the Sun, to rise and set close to that body. It moves through Capricornus all month. Distance the 1st is 148 million miles and the 28th is 155 million miles.

MARS: is in the evening sky, setting at about midnight. It moves through Aries all month, to the Taurus boundary. Its distance from the earth is increasing so rapidly that it is growing fainter and presenting a smaller and smaller disc in the telescope. Now it requires high power on a large telescope to reveal its surface markings. On the 1st, distance is 125 million miles, magnitude 0.8, and diameter 7"; on the 28th, distance is 149 million miles, magnitude 1.2, and diameter 6".

JUPITER: rises a short time after sunset, to remain above the horizon the remainder of the night. This largest of the planets presents a large, readily observable disc at all times, and has in addition the four bright satellites—so bright, in fact, that without the intense glare of their primary they could be seen with the unaided eye. In Virgo all month, its distance the 15th is 427 million miles.

SATURN: is assuming prominence in the late night sky. Rising shortly after midnight in Ophiuchus, it is one of the brighter planets. Its unique ring system can be made out in a small telescope, and becomes a wonderful sight as size and power of the telescope increase. In addition, Saturn has several satellites visible in moderate telescopes, Titan being the brightest. On the 15th it is 953 million miles from the earth.

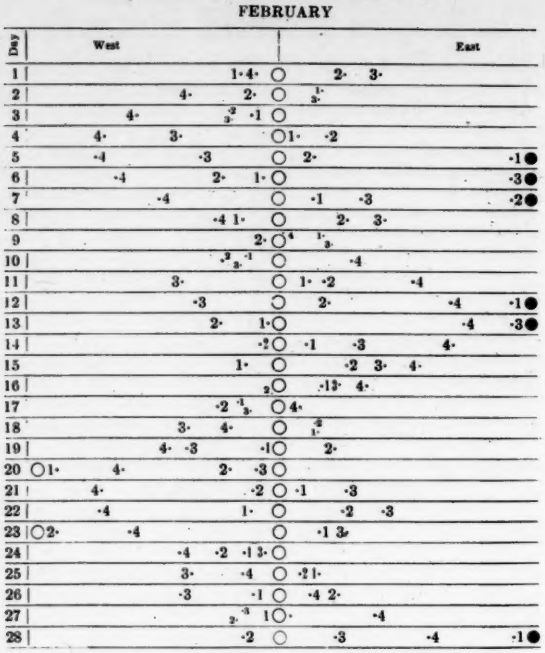
URANUS: holds forth in Cancer in the night sky. Just past opposition, it is well placed for observation, but can hardly be called an impressive sight. It is barely a naked-eye object. Distance the 15th is 1636 million miles.

NEPTUNE: is south of the equator in Virgo, at about the same declination as Spica. It rises not long after sunset and can be observed the remainder of the night. Faint and dull, its tiny disc is lacking in detail. Distance the 15th is 2779 million miles.

PLUTO: this most remote of the known planets comes to opposition on the 17th. Its highly inclined orbit throws it well out of the ecliptic, making it observable high in the Sickle of Leo. It is a very faint planet (magnitude 14), requiring a telescope of about 12 inch aperture to show it up as a feeble point of light. At its closest to the earth at opposition, it is a staggering 3118 million miles away. It is interesting to note in this connection that at perihelion Pluto can come closer to the earth than Neptune.

SATELLITES OF JUPITER

FEBRUARY



Appearance of Jupiter and its satellites at 2:45 A.M., E.S.T. as seen in an inverting telescope

Jupiter is represented by the disc in the center of the chart, and each satellite by a dot and its appropriate number. The direction of the satellite's motion is from the dot toward the numeral. The numeral. The numeral and light disc at the left margin of the chart indicates a satellite in transit across Jupiter's disc; the numeral and dark disc at the right margin indicates a satellite which is invisible because it is being eclipsed or occulted by Jupiter. This chart must be held upside down if binoculars, opera glasses, or an erecting type telescope is used.

ASTRONOMICAL CALENDAR

Eastern Standard Time

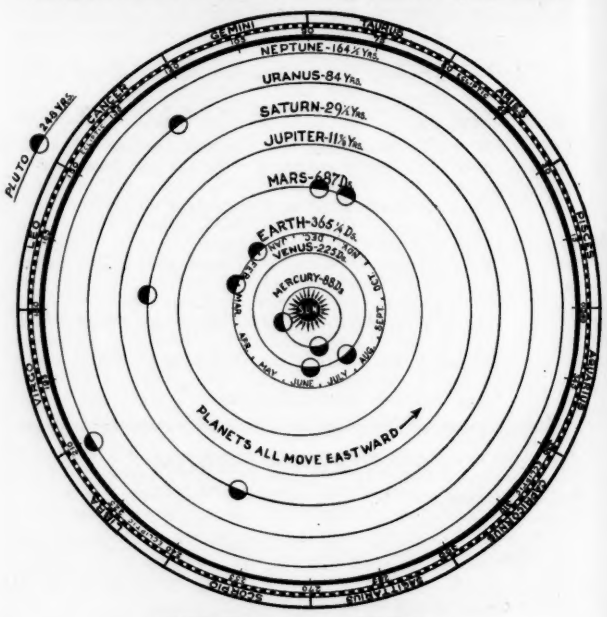
FEBRUARY 1957

February	2— 2:— pm	Mercury greatest elongation west, 25° 19'
	2— 7:49 pm	Minimum of Algol
	3— 3:— am	Neptune stationary in Right Ascension
	5— 4:38 pm	Minimum of Algol
	6— 6:05 pm	Conjunction, Mars and Moon; Mars south 0° 48'
	7— 6:— pm	Mercury in descending node
	8— 1:28 pm	Minimum of Algol
	11—10:17 am	Minimum of Algol
	13— 3:54 am	Conjunction, Uranus and Moon; Uranus north 5° 32'
	14— 7:06 am	Minimum of Algol
	16—10:02 pm	Conjunction, Jupiter and Moon; Jupiter north 5° 54'
	17— 3:56 am	Minimum of Algol
	17—10:— pm	Opposition, Pluto and Sun
	18—12:— am	Mercury in aphelion
	19— 2:43 am	Conjunction, Neptune and Moon, Neptune north 3° 42'
	20—12:45 am	Minimum of Algol
	22— 4:16 am	Conjunction, Saturn and Moon; Saturn north 0° 1'
	22— 9:34 pm	Minimum of Algol
	25— 6:23 pm	Minimum of Algol
	27— 6:— am	Venus in Aphelion
	28— 4:52 am	Conjunction, Mercury and Moon; Mercury south 7° 28'
	28— 3:13 pm	Minimum of Algol
	28— 3:33 pm	Conjunction, Venus and Moon; Venus south 6° 37'

MORNING SKY MAP FOR FEBRUARY

At 5:00 A.M., FEB. 1; 4:00 A.M., FEB. 15; 3:00 A.M., FEB, 28

HELIOCENTRIC POSITIONS OF THE PLANETS, FEBRUARY



AMATEUR'S FORUM

BY IRVING L. MEYER, M. S.

MARCH 1957

THE SUN: begins the month in Aquarius, enters Pisces, and then crosses the equator to the northern hemisphere, moving in Pisces the balance of the month. The earth's distance from the central luminary increases from 92.1 million miles the 1st, to 92.8 million miles the 31st.

THE MOON: is at perigee the 14th at 223,000 miles, and is at apogee the 26th at 252,000 miles.

Libration: Maximum exposure of the region on the Moon's limbs takes place as follows:

March 9	East limb, 7.3°
March 14	North limb, 6.6°
March 21	West limb, 7.0°
March 27	South limb, 6.7°

The Moon's phases (E.S.T.):

New Moon	March 1 at 11:12 am
First Quarter	9 at 6:50 am
Full Moon	15 at 9:22 pm
Last Quarter	23 at 12:04 am
New Moon	31 at 4:19 am

MERCURY: speeds north-eastwardly during the month, leaving Capricornus, passing through Aquarius, and crossing to the far side of Pisces. It is in superior conjunction with the Sun on the 20th, thereupon leaving the morning sky to enter the evening sky. It is, however, too close to the Sun the entire month to be observable. It is farthest from the earth the 15th at 127 million miles distance.

VENUS: is still technically a morning star, but is swiftly disappearing into the direction of the Sun. After it passes behind the Sun (next month) it will reappear in the evening sky in the summer, becoming a great attraction during the fall. It begins this month in Aquarius, moves through that constellation well into Pisces, to a point a little north of the equator and the northern area of Cetus. Distance is 155 million miles the 1st, increasing to 160 million miles by month-end. Too close to the Sun all month to be observable.

MARS: is in the evening sky, fleeing north-eastward before the Sun. It is still moderately bright, shining a little fainter than its near-neighbor, Aldebaran. However, the Ruddy Planet is now so far from the earth that it is a very disappointing telescopic object —much too small in apparent diameter to reveal any appreciable detail. By the end of the month it appears only about 20% larger than does Uranus! It moves from Aries into Taurus, passing a few degrees south of the Pleiades on about the 15th. Distance increases from 149 million miles the 1st, to 174 million miles the 31st.

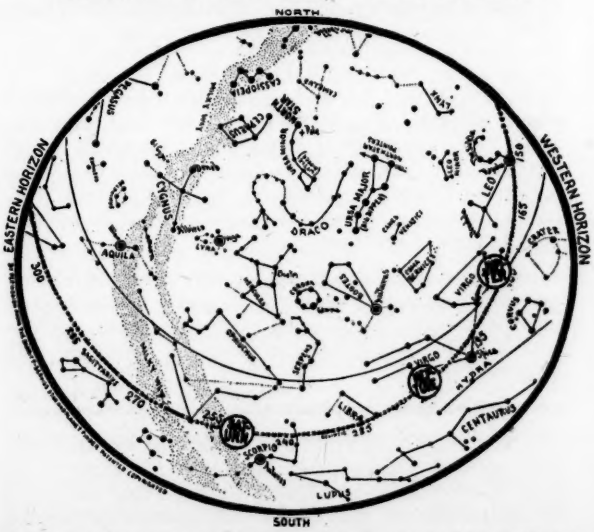
JUPITER: is undisputed lord of the night sky. Found a few degrees north of the equator, close to the star Beta Virginis, it is in opposition to the Sun on the 17th. It is closest to the earth then, at 413 million miles, and its tremendous size makes it a great sight for any telescope or binoculars. Equatorial diameter is 44", but its polar diameter is 3" less, with the result that it appears distinctly elliptical in the telescope. Reddish bands parallel to the planet's equator will be readily observed. Transits and eclipses of the four major satellites (refer to the satellite charts, elsewhere in the MAP) are highly interesting to watch, particularly in larger telescopes (6-inch and up). Magnitude is -2.0 all month.

SATURN: is in Ophiuchus all month, far south of the equator. Technically a morning star, it rises before midnight, remaining above the horizon the remainder of the night. Magnitude averages 0.6, making it bright to the naked eye. It rivals Jupiter as a telescopic attraction, as its famous rings appear about 39" in diameter —a span almost as great as the apparent diameter of Jupiter. Also, Saturn has several satellites which can be spotted in moderate-sized telescopes, though they are far less impressive than those of Jupiter. On the 15th, it is 910 million miles from the earth.

URANUS: is well placed for observation in the evening sky. Located in Cancer, and just past opposition, it is the first of the telescopic planets, though it can be seen with the naked eye under good conditions. Though it is one of the giant planets, it is so far away that it presents a very small disc in the telescope—only 4" in diameter. Distance the 15th is 1662 million miles.

NEPTUNE: is in Virgo all month, approaching opposition. Though well placed for observation, rising not long after dark, it is so remote that it can only be seen with optical aid—a telescope or good binoculars. On the 15th, distance is 2744 million miles, apparent diameter 2½", and magnitude is 7.7.

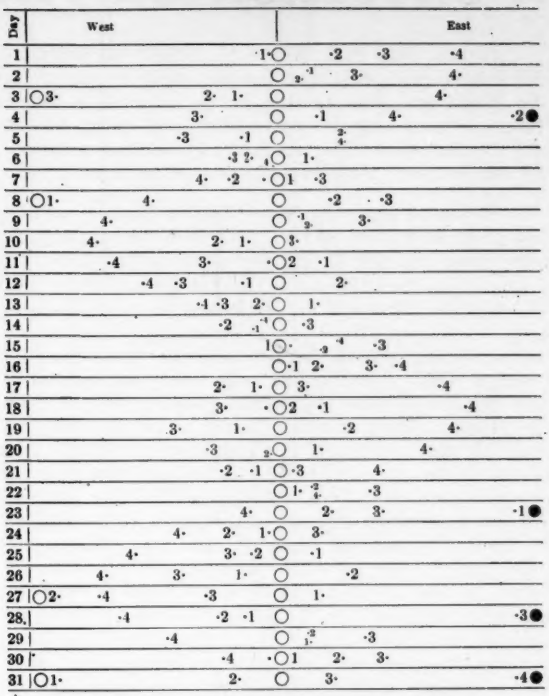
MORNING SKY MAP FOR MARCH



At 5:00 A.M., MAR. 1; 4:00 A.M., MAR. 15; 3:00 A.M., MAR, 31

SATELLITES OF JUPITER

MARCH



Appearance of Jupiter and its satellites at 1:15 A.M., E.S.T. as seen in an inverting telescope

ASTRONOMICAL CALENDAR

Eastern Standard Time

MARCH 1957

March	3—12:02 pm	Minimum of Algol
	4— 3:— pm	Quadrature, Saturn and Sun
	6— 8:51 am	Minimum of Algol
	7— 8:25 am	Conjunction, Mars and Moon; Mars north 1° 17'
	9— 5:41 am	Minimum of Algol
	10— 8:— am	Conjunction, Mercury and Venus; Mercury south 0° 47'
	10— 8:— am	Mercury greatest heliocentric latitude south
	12— 2:30 am	Minimum of Algol
	12—12:35 pm	Conjunction, Uranus and Moon; Uranus north 5° 38'
	14—11:19 pm	Minimum of Algol
	16— 4:07 am	Conjunction, Jupiter and Moon; Jupiter north 6° 3'
	17— 1:— pm	Opposition, Jupiter and Sun
	17— 8:08 pm	Minimum of Algol
	18—11:52 am	Conjunction, Neptune and Moon; Neptune north 3° 33'
	20— 1:— pm	Superior conjunction, Mercury and Sun; Mercury south 1° 22'
	20— 4:17 pm	Sun enters Aries; Equinox
	20— 4:58 pm	Minimum of Algol
	21—11:— am	Venus greatest heliocentric latitude south
	21— 1:23 pm	Conjunction, Saturn and Moon; Saturn south 0° 15'
	23— 1:47 pm	Minimum of Algol
	23—11:— pm	Saturn stationary in Right Ascension
	26—10:36 am	Minimum of Algol
	29— 7:25 am	Minimum of Algol
	29— 9:— am	Mercury in ascending node
	31—12:54 am	Conjunction, Venus and Moon; Venus south 5° 14'

A DISCUSSION ON PLANETARY CONFIGURATIONS

A card from Mrs. Albert M. Bonelli of Vicksburg, Mississippi asks: "Wasn't a mistake made in stating that the Moon and Mars, which are in conjunction tonight (Nov. 13) are only 6° apart? Must have meant 16° the way the chart shows and comparing by distances otherwise. I'd like to know, please, for my own information."

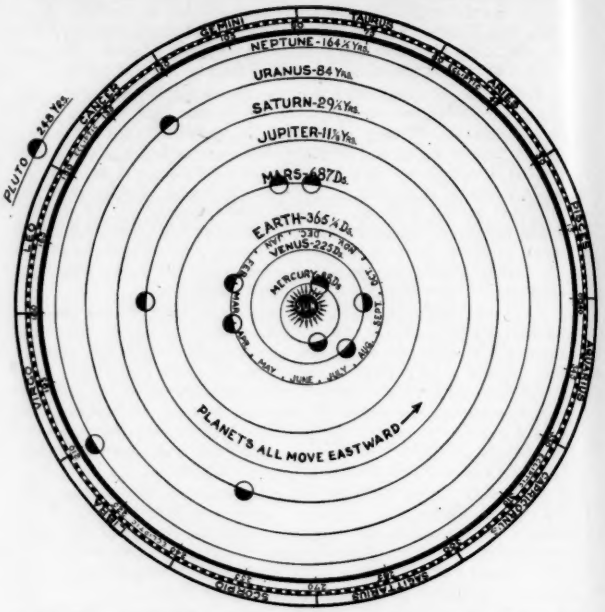
By way of answering Mrs. Bonelli's question we'll go into a little of the why and wherefor of the various conjunctions listed monthly in the *Astronomical Calendar*. The *Calendar* was correct in stating that at 6:34 a.m. on the 13th of November, Mars and the Moon were in conjunction and only 6° 34' apart. There are, however, two important elements affecting conjunctions — one is the time, the other parallax. With regard to the first — the time element — note that the moment of conjunction was 6:34 *a.m.* Since the Moon makes a complete circuit of the heavens in a little less than one month, its hourly motion is of the order of ½°. In this period of time, it moves by an amount equal approximately to its own diameter; in a day it covers a distance nearly three times the spacing between the Pointers in the Big Dipper! Of course, a planet like Mars moves pretty rapidly, too, but many, many times slower than the Moon, so that its effect relative to the Moon is zero. Our reader, in all probability, looked for the conjunction on the *night* of the 13th — some half a day or more after actual conjunction — and by which time the Moon would be at least 6° further to the east. The Moon's spacing from Mars would therefor be about twice that at conjunction and closer to the 16° figure mentioned.

This brings us to the second element affecting a conjunction. That is *parallax* or the apparent dislocation of an object seen from two different directions. The positions of the Moon and planets are all computed as seen from the center of the earth *(geocentric)* since this is a common reference point. The displacement or parallax of a celestial body depends on its distance. In the case of the nearest stars, an extremely minute, but measurable, shift occurs when the star is viewed from opposite sides of the earth's orbit — a span of 186 million miles. Obviously even the nearest stars are extremely far away. The planets are all much closer and shift position in the sky a small amount when seen from different locations on the earth's surface. The Moon, our nearest celestial neighbor, is so close that as it rises at one point on the earth's surface it is about two degrees removed from the point in the star fields at which it sets on the opposite side of the earth. Remember, then, that if the reader bears in mind that all conjunctions are computed as seen from the earth's center, a little consideration of the lunar conjunctions will clear up their appearance as seen from your location on the earth's surface. From a practical standpoint, only if the Moon is *exactly* overhead at the time of conjunction will it conform to the details of the *Calendar*. Generally speaking, observers in northern climes see the Moon south of the zenith; parallax will tend to push the Moon still further south. Also, if the Moon is east of the meridian parallax will push it further east; if west of the meridian, further west. If you have difficulty understanding parallax, try a simple experiment: close the left eye, hold a finger in front of you, and sight it on a nearby object, such as a light switch. Then, without moving that finger, close the right eye and open the left. And watch the finger jump off the light switch!

Just what is the definition of conjunction? Opposition? Quadrature? With respect to the Sun it is the instant when the longitude of the planet differs by 0° at conjunction and 180° at opposition; at quadrature, the geocentric angular distance between Sun and planet is 90°. With respect to Moon and planet and planets with each other the right ascension is the same or 180° different. Longitude is measured from 0° to 360° along the plane of the ecliptic; right ascension is measured in like fashion in the plane of the earth's equator. Since the equator and ecliptic are inclined to each other by somewhat better than 23° they obviously offer substantially dissimular reference points.

—Mrs. Leon Barritt

HELIOCENTRIC POSITIONS OF THE PLANETS, MARCH



MIRA, THE WONDERFUL

Some years before the invention of the telescope, the Dutch astronomer Fabricius noted a third magnitude star in Cetus where no star had previously been recorded. Some weeks later it had faded from sight. A few years later it was designated Omicron Ceti by Bayer as he charted the stars. A generation later, Holwarda noted its variability, and further, established that its variability had a period of about eleven months. Mira, "The Wonderful" lives up to its name. Generally listed as varying from magnitude 2.0 to 9.6, it is not consistent in its behavior. Maximum varies between 1.5 and 5.6; minimum, from 8.0 to 10.0. This means that the star can be 2500 time as bright at its brightest over its faintest minimum.

At its maximum in December, 1956 it was hardly impressive, remaining at 4th to 5th magnitude. Its next maximum is scheduled for the first week of November of this year. Will it be a bright second magnitude—or a faint 5th? Time will tell.

Your address, as printed on the mailing wrapper, contains your expiration information — the first digit is the *issue number,* followed by the year. For example, "2-57" means that the last issue of the subscription would be the second (April-May-June) of 1957. If there is any discrepancy in expiration, or address, kindly advise.

BOOK REVIEW

THE EXPLORATION OF MARS

By WILLY LEY and WERNHER VON BRAUN,
with paintings by Chesley Bonestell
(The Viking Press, New York, 1956)

To put it mildly, we are highly impressed with this brand new addition to the works on the mysterious planet Mars. The first chapters are factual, giving a fine digest of information on the planet, covering not only a history of our study of our ruddy neighbor, but embracing all manner of tabular material, reproductions of famous photographs and drawings, and an up-to-date discussion of the theories concerning Mars. The style of writing is extremely easy to read—compelling, in fact, is a better word. Anyone going through the first chapters only, will be amply rewarded—will probably have covered the most comprehensive and easily digested Martian history. The later chapters take us into the realm of space travel, but in the same wonderful manner as the earlier chapters, that make the painstaking details easy and pleasant to read and assimilate. This completeness of detail lends strength to the authors' statement "... we, the genus homo of earth, will set foot on Mars within a matter of decades." The reader can readily "live" the expedition to Mars. And not the least important to this volume are the truly impressive drawings of Chesley Bonestell—drawings, many in color, of unbelieveable realism.

THE EXPLORATION OF MARS contains 176 pages of enlightenment, including an extensive bibliography, many illustrations, and performance data for the spacecraft.

(Available through the Monthly Evening Sky Map, $5.10, postpaid)

GEOGRAPHOS

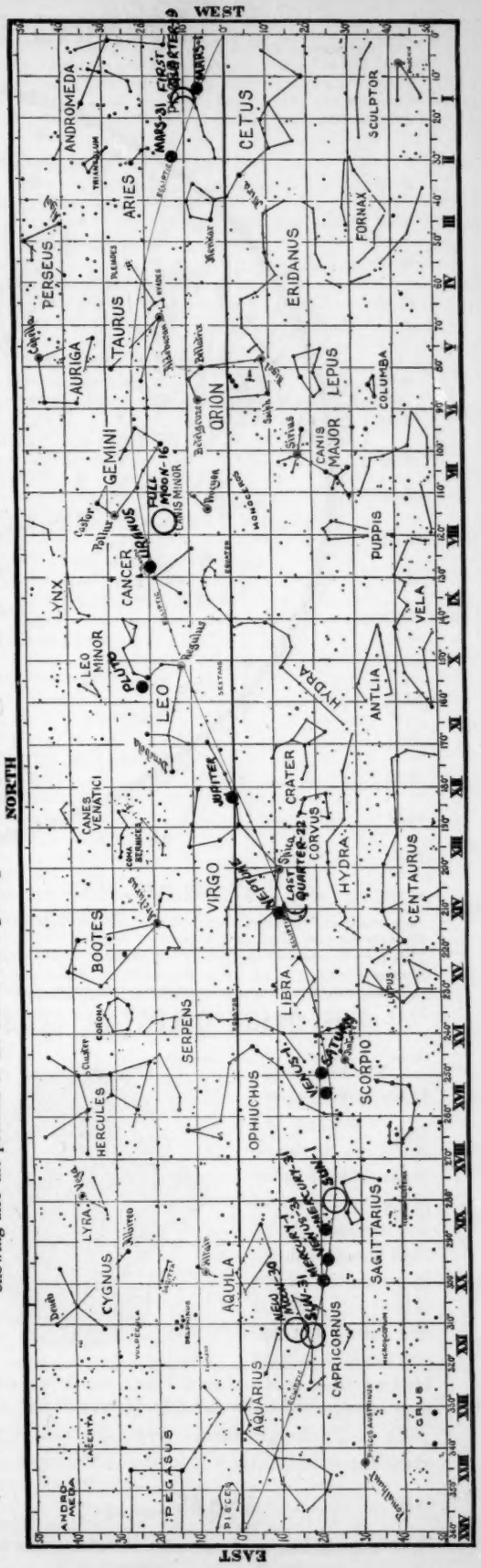
A tiny asteroid, discovered in 1951 with the Mount Palomar Schmidt telescope, has turned out to be one of our nearest neighbors in space. Calculation of the orbit of this minor planet by Dr. Herrick of the University of California at Los Angeles reveals that in 1969 it will be less than four million miles from the earth—a stone's throw, by astronomical reckoning. This little world circles the Sun in 17 months.

The main value of an asteroid like this is that at its close meeting with the earth in 1969, careful observation from different locations on the earth's surface will enable astronomers to determine still more accurately than in the past the length of the astronomical unit—or, in other words, the exact number of miles from the earth to the Sun, our basic yardstick of the universe.

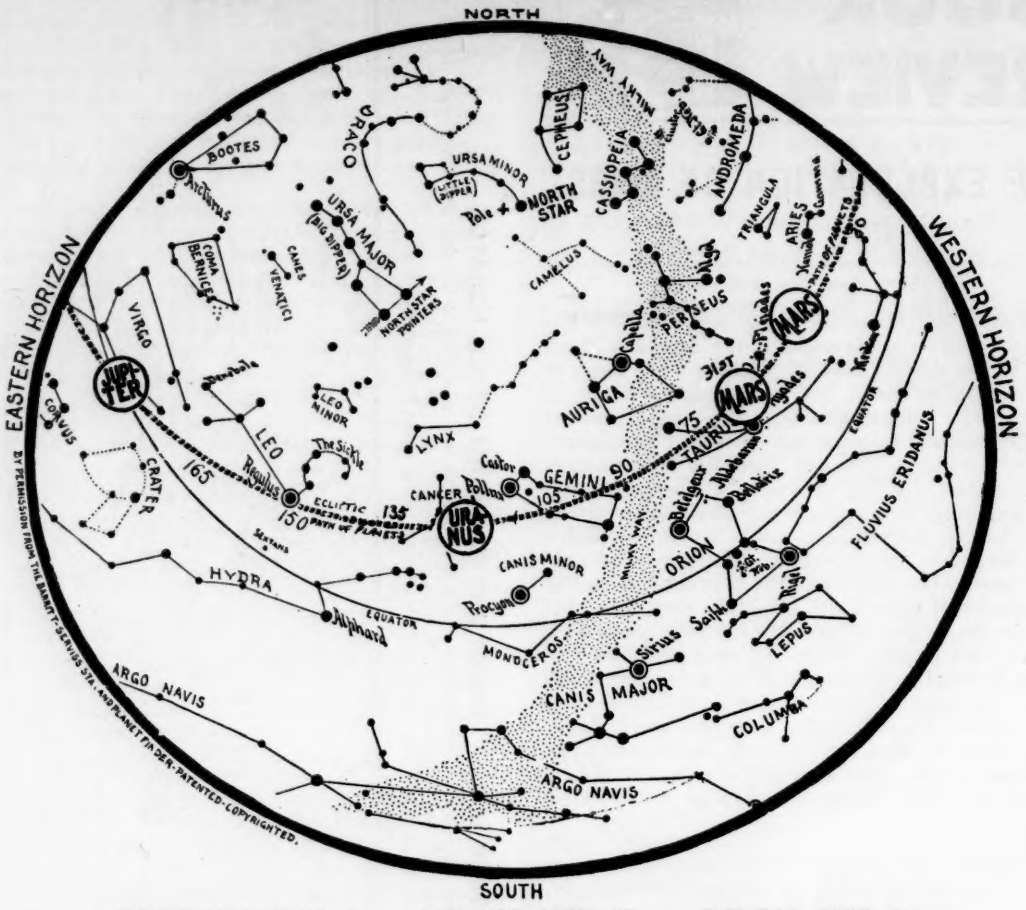
Send us the name and address of anyone you feel may be interested in "The Monthly Evening Sky Map". We will be glad to send a sample copy.

A MERCATOR PROJECTION OF THE STAR FIELD FOR 50° NORTH AND 50° SOUTH OF THE EQUATOR

The Star Field makes an apparent complete revolution westward every 24 hours, hence the hourly division from I to XXIV, but this has no relation to the time that any portion of the map is in view. Practical as a Star, Constellation and Planet Finder for the current month—January, 1957—Anywhere in the world.
Showing also the position of the Sun at the beginning and ending of the month and the position of the Moon at its several phases.



EVENING SKY MAP FOR MARCH



AT 9:00 P.M., MAR. 1 8:00 P.M., MAR. 15 7:00 P.M., MAR: 31

Face South and hold the Map overhead, the top North, and you will see the stars and planets just as they appear in the heavens. The arrow through the two stars in the bowl of the Big Dipper points to the North Star, the star at the end of the handle of the Little Dipper. This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitudes in Europe.

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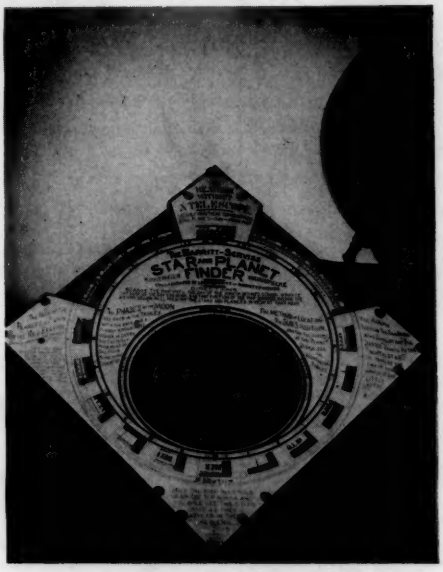

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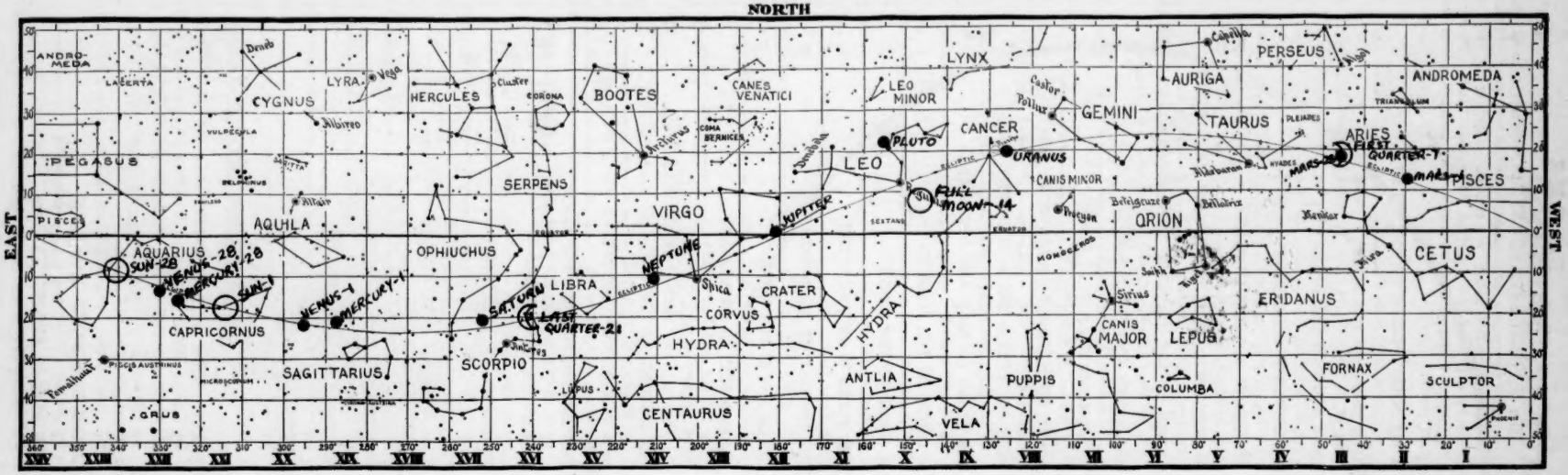

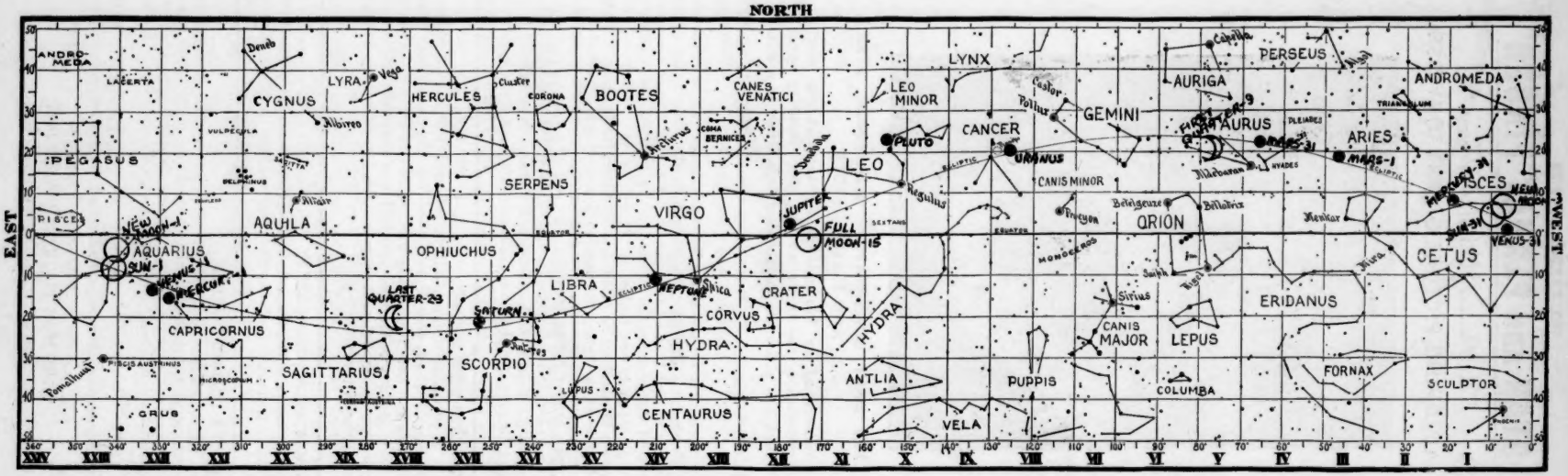

Nov. 5 Oct. 22 Oct. 5 Sept. 20 Sept. 5 Aug. 20 Aug. 5 July 20 July 5 June 20 June 5 May 20 May 5 Apr. 20 Apr. 5 Mar. 20 Mar. 5 Feb. 18 Feb. 2 Jan. 20 Jan. 5 Dec. 20 Dec. 5 Nov. 20

THE DATE BELOW EACH NUMERAL WILL SHOW WHEN THAT SECTION OF THE MAP WILL BE ON THE MERIDAN—DUE SOUTH—AT 9 P.M. OR AN HOUR EARLIER FOR EACH NUMERAL WEST OF THIS DATE AND AN HOUR LATER FOR EACH NUMERAL EAST.